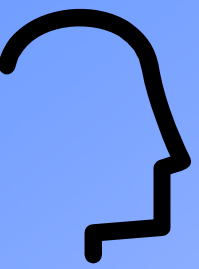
ESH Coordinators Meeting

Effective Corrective Action Development Subject Area

Presented by Ed Sierra
Occurrence Program Coordinator
Quality Programs & Services Office

May 22, 2003

Effective Corrective Action Development Subject Area



OUTLINE

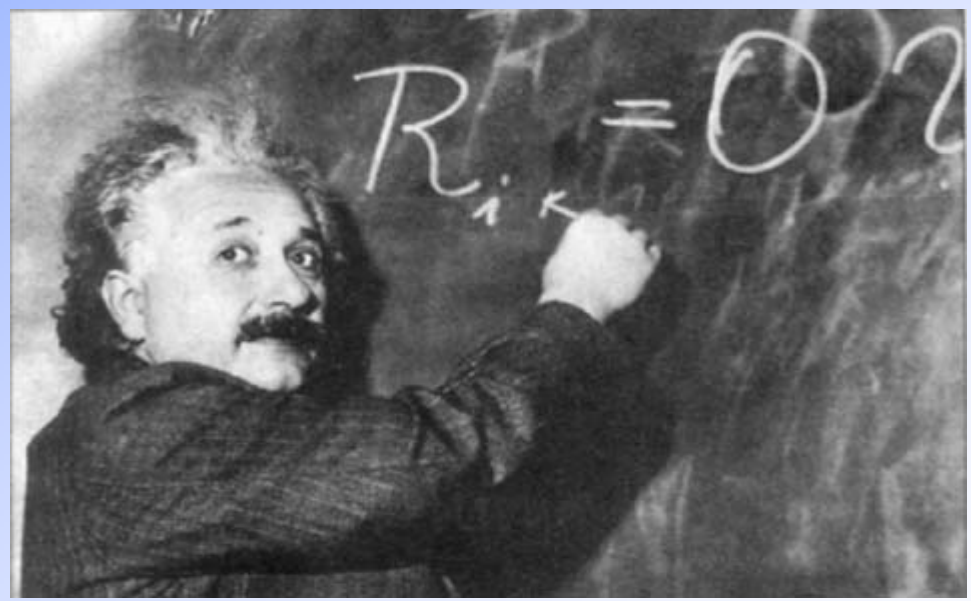
- ***Purpose***
- ***Background***
- ***Drivers***
- ***Scope***
- ***Approach***
- ***Informational Sessions***
- ***Questions***

Why do a Causal Analysis?

- **Promote better corrective actions to prevent recurrence**
  - **Effective corrective actions flow from causes**
    - ***WE MUST MELT THE ICEBERG***

Why do a Causal Analysis? II

"It's impossible to solve significant problems using the same level of knowledge that created them!"



Background

- Owner – J. Tarpinian
- Notice of Intent – April 01
- Team: Commenced work in July 02
  - Ed Sierra – (Team Leader), QP&SO
  - Dave Passarello, CA-D
  - Steve Hoey, SMSIO
  - John Boccio, EENS
  - Stasia Scocca, QP&SO
  - John Usher, IO Office/PAAA
  - Ray Costa, EP
  - Joyce Mortimer (Administrative Support), QP&SO
  - Tina Youngmann (Technical Writer), SBMS

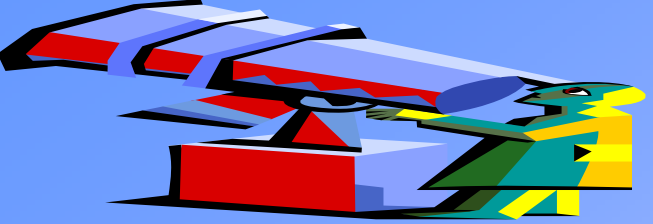
Background II

- Point of Contact Team Members Review & Approval:
  - **Mike Zarcone, Physics**
  - **Pat Williams, EP**
  - **Andy Levine, RCD**
  - **Bill Gunther, Medical**
  - **Nicole Bernholc, S&HS**
- **"Overall, this is an impressive subject area that should standardize the manner in which causal analysis and corrective actions are approached across BNL. The subject area is easy to navigate and provides very straight-forward information on causal analysis and corrective action development."**

  Dr. John Dew, Director for Continuous Quality Improvement - University of Alabama

Drivers

- DOE M 232.1-1A Occurrence Reporting and Processing of Operations Information
  - ORPS Re-design category – "Repetitive"
- DOE O 414.1A Quality Assurance
- 10CFR Part 830 Subpart A – Quality Assurance
- International Standard ISO 14001
- Mitigation of PAAA civil penalties (50%) for corrective actions that prevent recurrence
- E. I. Du Pont de Nemours and Company - Safety Benchmarking Assessment (Feb. 03)
- This SA replaces IO-SOP-11, Conducting Causal Analysis For PAAA Noncompliances, Rev. 1.



Scope

1. **Selecting Causal Analysis Methodologies**
   - **Selection guidance (Graded approach)**
   - **SME's identified**
2. **Implementing Causal Analysis**
   - **10 methods available**
   - **ORPS causal analysis tree (CAT team review)**
3. **Developing Corrective Actions**
   - **Physical barriers**
   - **Admin. barriers**
   - **Management barriers**

Causal Analysis Methodologies
A Recipe for Effective Corrective Actions

- Low Complexity Level
  - What-if Analysis
  - Five Whys
  - Brainstorming
  - Expert Judgment
- Moderate Complexity Level
  - Barrier Analysis
  - Change Analysis
  - Events & Causal Factors Analysis
- High Complexity Level
  - Fault Tree Analysis
  - Management Oversight and Risk Tree Analysis
  - TapRoot

Causal Delight

START HERE

A1 Equipment/Material Problem

B1 CALIBRATION PROGRAM FOR INSTRUMENTS
1. No calibration program
2. Calibration program LTA

B2 EQUIPMENT HISTORY
1. No equipment history
2. Equipment history LTA

B3 PREVENTIVE MAINTENANCE FOR EQUIPMENT
1. No preventive maintenance for equipment
2. Preventive maintenance for equipment LTA

B4 INSPECTION/TESTING PROGRAM
1. No inspection/testing program
2. Start-up testing program LTA
3. Routine testing program LTA
4. Inspection LTA

B5 MATERIAL CONTROL
1. Material handling LTA
2. Material storage LTA
3. Material packaging LTA
4. Material shipping LTA
5. Shelf life exceeded
6. Unauthorized material substitution
7. Storage of spare parts LTA
8. Error by manufacturer in shipping or marking
9. Contaminant

B6 PROCUREMENT CONTROL
1. Control of changes to procurement specifications/ purchase order LTA
2. Fabricated item does not meet requirements
3. Incorrect item received
4. Product acceptance requirements LTA

B7 DEFECTIVE OR FAILED
1. Defective or failed part
2. Defective or failed material
3. Defective weld, braze or soldering joint
4. End of life failure
5. Electrical or instrument noise

A2 Procedure Problem

B1 DEFECTIVE OR INADEQUATE PROCEDURE
1. Format confusing
2. More than one action per step
3. Multiple area references
4. No checkoff space provided
5. Inadequate checklist
6. Data/computations wrong/incomplete
7. Graphics LTA
8. Equipment identification LTA
9. Ambiguous instructions/ requirements
10. Presentation of limits LTA
11. Excessive references
12. Identification of revised steps LTA
13. Typographical error
14. Sequence wrong
15. Facts wrong/ requirements not correct
16. Incomplete/situation not covered
17. Wrong revision used
18. Inconsistency between requirements

B2 NOT USED
1. Lack of procedure
2. Not available or inconvenient for use
3. Procedure difficult to use
4. Training & reference procedure

A3 Personnel Error

B1 COMMUNICATION PROBLEM
1. Communication between work groups LTA
2. Communication between shifts & management LTA
3. Correct terminology not used
4. Verification/repeat back not used
5. Long message
6. Speech interference
7. Communication within shifts LTA
8. Communication between shifts LTA

B2 INATTENTION TO DETAIL

B3 PROCEDURE NOT USED OR USED INCORRECTLY

B4 OTHER HUMAN ERROR
1. Knowledge-based decision required
2. Excessive control action requirements
3. Unrealistic monitoring requirements
4. Excessive mental workload
5. Errors not detectable
6. Errors not recoverable
7. Personal performance LTA*

A4 Design Problem

B1 INADEQUATE WORK ENVIRONMENT
1. Controls LTA
2. Displays LTA
3. Control/display integration LTA
4. Conflicting layouts
5. Reach or visual envelope LTA
6. Labeling LTA
7. Housekeeping LTA
8. Climate LTA
9. Lighting LTA
10. Excessive noise
11. Protective clothing
12. No communication method available
13. Other environmental stresses

B2 INADEQUATE OR DEFECTIVE DESIGN
1. Design input cannot be met
2. Design input obsolete
3. Design input not correct
4. Necessary design input not available
5. Design output scope LTA
6. Design output not clear
7. Design output not correct
8. Inconsistent design output
9. Design input not addressed in design output
10. Design/documentation not complete
11. Designs/documentation not up to date

B3 INDEPENDENT REVIEW/ VERIFICATION
1. No independent review/verification
2. Incomplete review/verification

B4 DRAWING, SPECIFICATION, OR DATA ERROR

A5 Training Deficiency

B1 NO TRAINING PROVIDED
1. Decision not to train
2. Training requirements not identified

B2 TRAINING RECORDS SYSTEM LTA
1. Training records incorrect
2. Training records not up to date

B3 TRAINING LTA
1. Job/task analysis LTA
2. Program design LTA
3. Training objectives LTA
4. Inadequate content
5. Insufficient practice or hands on experience
6. Qualifications testing LTA
7. Insufficient refresher training
8. Training support equipment LTA
9. Instructor qualifications LTA
10. Training on new work methods LTA
11. Abnormal events/ emergency training LTA
12. Qualification standard LTA
13. Inadequate presentation or material

A6 Management Problem

B1 INADEQUATE ADMINISTRATIVE CONTROL
1. Not strict enough
2. Confusing or incomplete
3. Technical error
4. Responsibility for item/activity not adequately defined
5. Contradictory requirements
6. Scheduling/ tracking system LTA
7. Employee screening LTA
8. Recently changed
9. Difficult to implement
10. Implementation of lessons learned LTA

B2 INADEQUATE RESOURCE ALLOCATION

B3 WORK ORGANIZATION/ PLANNING DEFICIENCY
1. No preparation
2. Job plan LTA
3. Instructions to workers LTA
4. Walk-through LTA
5. Scheduling LTA
6. Worker selection LTA

B4 INADEQUATE SUPERVISION
1. No supervision
2. Supervision LTA

B5 POLICY NOT ADEQUATELY DEFINED/ DISSEMINATED/ ENFORCED
1. No SPAC
2. Communication of SPAC LTA
3. Enforcement LTA

B6 OTHER MANAGEMENT PROBLEMS
1. Safety review LTA
2. Safety review not performed
3. Safety review recommendations not yet implemented
4. Corrective action LTA
5. Corrective action not yet implemented
6. Control of changes to service procurement specifications purchase order LTA
7. Service does not meet requirements
8. Service acceptance requirements LTA
9. Control of design/field changes LTA
10. Control of as-built documents LTA

A7 External Phenomena

B1 WEATHER OR AMBIENT CONDITIONS

B2 POWER FAILURE OR TRANSIENT

B3 EXTERNAL FIRE OR EXPLOSION

B4 THEFT TAMPERING SABOTAGE OR VANDALISM

B5 OTHER NATURAL PHENOMENON

A8 Radiological/ Hazardous Material Problem

B1 LEGACY CONTAMINATION

B2 SOURCE UNKNOWN

Level A nodes are in Blue. Level B nodes are in Green. Level C nodes are in Magenta.
LTA = Less than adequate SPAC = Standards, policies and administrative controls
ORPS cause categories are underlined. ORPS reports require at least one B or C level ORPS cause code.
* Examples include: Sensory/perceptual capabilities LTA, Motor/physical capabilities LTA, Attitude/ psychological profile LTA, Reasoning capabilities LTA, Attention below minimum standards and Rest/sleep LTA.

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Approach

- **Graded approach**
  - **Level of causal analysis/corrective actions commensurate with the problem**

Informational Sessions

- SBMS Steering Committee - 5/21
- ESH Coordinators - 5/22
- OPS Council - 5/27
- Quality Reps - June
- Building Managers - July

Questions

- Presentation Wrap-Up